

1 **REMARKS**

2 In an earlier Office Action, dated May 27, 2003, the Examiner identified three distinct  
3 inventions, identified as Group I (claims 1-27), Group II (claims 28-38) and Group III (claims 39-47)  
4 and required restriction of the examination of the present patent to one set of claims. In a response  
5 filed June 27, 2003, the Applicant responded by selecting Group I for examination. In the present  
6 Office Action, the Examiner objected to the drawings as not showing every feature of the invention  
7 specified in the claims and objected to the title as not being descriptive. With regard to the claims, the  
8 Examiner rejected claims 1, 2, 9-11, 12, 16-18 and 24-26 under 35 U.S.C. § 103(a) as being  
9 unpatentable over Triplett ( U.S. Patent No. 4,870,310) and Post (U.S. Patent No. 6,111,332) and  
10 Hagiwara (JP 56-063,117), rejected claims 13 and 27 under 35 U.S.C. § 103(a) as being unpatentable  
11 over these same patents and routine skill in the art, and rejected claim 15 under 35 U.S.C. § 103(a) as  
12 being unpatentable over the above patents and in further view of Murakami, et al. (JP 59-373,323).  
13 The Examiner identified claims 3-8 and 19-23 as be allowable if rewritten in independent form to  
14 include the limitations of the base claim and any intervening claims. In response, the Applicant  
15 hereby amends FIG. 4a of the drawings, amends the title, amends certain claims to comply with the  
16 Examiner's objections, and submits arguments in opposition to the Examiner's rejection of claim 12  
17 and in support of the patentability of that claim. As set forth in more detail below, the Applicants  
18 believe the arguments and amendments made in response to the Examiner's rejections have placed the  
19 application in condition for allowance.  
20

21 **The Drawings**

22 The Examiner objected to the drawings as not showing every feature of the invention  
23 specified in the claims, namely the power input for storing electrical power (claims 1 and 17), power  
24 output for retrieving electrical power (claims 1 and 17) and the outside diameter to inside diameter of  
25 the composite rotor having a ratio of 2-1. With regard to the power input and power output features,  
26 Applicant has cancelled these features from claims 1 and 17, as set forth in the amended claims. With

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1 regard to the ratio of the outside to inside diameter feature, Applicant is submitting a document  
2 entitled "Submission of Proposed Drawing Amendment for Approval by Examiner" which amends  
3 FIG. 4a so as to incorporate the 2-1 ratio. Specifically, Applicant has amended this figure to show  
4 the inside diameter as x and the outside diameter as 2x.

5  
6 The Title

7 As set forth herein, the Applicant is hereby amending the title from "Annular Electro-  
8 Mechanical Battery" to "Electro-Mechanical Battery" to comply with the Examiner's request for a  
9 title that is clearly indicative of the invention to which the claims are directed.

10  
11 Claims 3-8 and 19-23

12 The Examiner identified claims 3-8 and 19-23 as be allowable if rewritten in  
13 independent form to include the limitations of the base claim and any intervening claims. In response,  
14 the Applicant has amended claims, as set forth below, to incorporate the limitations of certain claims  
15 and added new claims 48-56 that incorporate the limitations of other claims, as also set forth in the  
16 summary below.

17  
18 Claim 1: The Examiner identified claim 3 as being allowable. The Applicant has amended claim  
19 1 to incorporate the limitations of claims 2 and 3, which are cancelled by this  
20 amendment, and to eliminate the power input and power output limitations.

21 Claim 2: Cancelled as being incorporated into claim 1 as an intervening claim

22 Claim 3: Cancelled as being incorporated into claim 1 - objected to by the Examiner.

23 Claims 4-12: Unchanged

24 Claim 13: Amended to add the word "composite" prior to "rotor" for consistency purposes.

25 Claims 14-16: Unchanged

26  
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1 Claim 17: The Examiner identified claim 19 as being allowable. The Applicant has amended  
2 claim 17 to incorporate the limitations of claims 18 and 19, which are cancelled by this  
3 amendment.

4 Claim 18: Cancelled as being incorporated into claim 17 as an intervening claim

5 Claim 19: Cancelled as being incorporated into claim 17 - objected to by the Examiner.

6 Claims 20-27: Unchanged  
7

8 Claim 48: New independent claim. This claim is a combination of original claims 8, 5, 4, 3, 2  
9 and 1. The Examiner identified claim 8 as being allowable. Claim 1 is the base claim  
10 and claims 2 through 5 are the intervening claims, the limitations thereof being  
11 incorporated into new claim 48.

12 Claims 49-56: New claims. These claims incorporate the limitations of claims 9 through 16,  
13 respectively, except dependent on claim 48 (or any intervening claim) instead of claim  
14 1 (or any intervening claim).

15 Claim 57: New independent claim. This claim is a combination of original claims 12 and 1  
16 (without the power input and power output elements). The Examiner rejected claim 12  
17 as being obvious in light of the prior art. As set forth in more detail below, Applicant  
18 respectfully disagrees and believes claim 57 is allowable.

19 Claims 58-69 New claims. These claims incorporate the limitations of claims 4-11 and 13-16,  
20 respectively, except dependent on claim 57 (or any intervening claim) instead of claim  
21 1 (or any intervening claim).  
22

23 Claims 57-69

24 As stated above, new independent claim 57 is a combination of original claims 12 and  
25 1. Claim 1 is an independent claim directed at an electro-mechanical battery having a housing, a  
26 central core fixedly disposed in the housing and having an internal raceway structure thereon, a

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1 composite rotor enclosed in the housing around the central core such that it is configured to spin about  
2 its vertical axis in the housing, and one or more set of permanent magnet arrays on the internal  
3 raceway and disposed between the composite rotor and central core. Claim 12 added the limitation  
4 that the composite rotor has a substantially teardrop-shaped cross-section. Claim 57 combines these  
5 claims. The Examiner rejected claim 12 under 35 U.S.C. § 103(a) as being unpatentable over  
6 Triplett, Post and Hagiwara, stating "Triplett teaches a teardrop composite rotor 29 supported by  
7 magnetic bearings ...." (Office Action, page 3, paragraph 6.) Respectfully, Applicant disagrees with  
8 the Examiner's analysis.

9           In support of this Response, Applicant is submitting his declaration under Rule 132  
10 (hereinafter, the "Jennings Decl."). As set forth therein, Mr. Jennings is the inventor of the subject  
11 patent application and he has significant experience in industrial engineering and fabrication.  
12 (Jennings Decl., ¶¶ 1 & 2.) Mr. Jennings has closely followed the development of composite flywheel  
13 energy storage for more than ten years and during this time he has attended meetings with persons  
14 associated with flywheel research, including those at the United States Air Force, NASA and the  
15 United States Department of Energy. (Jennings Decl., ¶ 3.) Mr. Jennings has met with many  
16 engineers and other technical professionals regarding this technology, attended technical meetings and  
17 conferences and reviewed numerous industry and technical publications, acquiring a significant  
18 appreciation of the technology associated with composite flywheel energy storage devices, including  
19 electro-mechanical batteries. (Jennings Decl., ¶ 4.) Mr. Jennings has reviewed the Examiner's Office  
20 Action for his patent application and the references cited by the Examiner, including the Triplett  
21 patent. (Jennings Decl., ¶ 5.)

22           With regard to the Examiner's analysis that Triplett discloses a composite rotor having  
23 a teardrop-shaped cross-section, Applicant respectfully disagrees with the Examiner. (Jennings Decl.,  
24 ¶¶ 6, 8-9.) For purposes of his invention, the teardrop-shaped rotor provides significant advantages  
25 for the high-strength filaments that are spiral-wound over the surface of the rotor with regard to the  
26 structural capabilities of these filaments. (Jennings Decl., ¶¶ 7, 9-11.) The inventor's teardrop-shaped

1 configuration provides significant benefits for his invention with regard to the tension forces imposed  
2 upon the spiral-wound filaments. (Id.) In contrast, the Triplett patent discloses the use of a rotor in  
3 the general shape of an isosceles trapezoid, not a teardrop. (Jennings Decl., ¶ 8.) No where in the  
4 Triplett patent is the use of a teardrop-shaped rotor described, mentioned or even suggested and it  
5 would not be obvious to utilize such a configuration in the Applicant's invention from the Triplett  
6 patent or any of the other references cited by the Examiner. (Jennings Decl., ¶¶ 8 & 12.) In fact, due  
7 to lack of external surface winding in the rotor disclosed in the Triplett patent, there would have been  
8 no benefit for that inventor to configure his rotor in a teardrop cross-section shape, particularly in  
9 light of the increased fabrication difficulties. (Jennings Decl., ¶¶ 8 & 9.) Based on his knowledge of  
10 the industry and the related technology, the Applicant does not believe it would be obvious to one  
11 skilled in the art to utilize a teardrop configuration for the rotor. (Jennings Decl., ¶ 12.) Further,  
12 none of the references cited by the Examiner suggest, compels or motivates a person to utilize a  
13 teardrop-shaped cross-section for the rotor of the electro-mechanical battery of the present invention  
14 and, without the benefit of his invention, there would simply be no reason to combine the subject  
15 references to obtain a teardrop-shaped rotor. (Id.)

16 As stated by the Applicant, respectfully, the Triplett does not disclose a teardrop-  
17 shaped rotor and nothing suggests combining the teachings of Triplett with Post and/or Hagiwara, in  
18 any combination suggested by the Examiner, to arrive at Applicants' invention. (Jennings Decl., ¶¶ 8  
19 & 12.) As stated by the court in In re Geiger, 2 USPQ2d 1276 (CAFC 1987), "[o]bviousness cannot  
20 be established by combining the teachings of the prior art to produce the claimed invention, absent  
21 some teaching, suggestion or incentive supporting the combination." (In re Geiger, 2 USPQ2d at  
22 1278.) The motivation or suggestion to combine references must exist, otherwise the determination of  
23 obviousness involves nothing more "than indiscriminately combining prior art." (Micro Chemical Inc.  
24 v. Great Plains Chemical Co., 41 USPQ2d 1238, 1244 (CAFC 1997).) In In re Fritch, 23 USPQ2d  
25 1780 (CAFC 1992), the Federal Circuit stated the following:

1 In proceedings before the Patent and Trademark Office, the Examiner bears the burden of  
2 establishing a prima facie case of obviousness based upon the prior art. The Examiner can  
3 satisfy this burden only by showing some objective teaching in the prior art or that knowledge  
generally available to one of ordinary skill in the art would lead that individual to combine the  
relevant teachings of the references.

4 Obviousness cannot be established by combining the teachings of the prior art to produce the  
5 claimed invention, absent some teaching or suggestion supporting the combination. Under  
6 section 103, teachings of references can be combined *only* if there is some suggestion or  
7 incentive to do so. Although couched in terms of combining teachings found in the prior art,  
the same inquiry must be carried out in the context of a purported obvious "modification" of  
the prior art. The mere fact that the prior art may be modified in the manner suggested by the  
Examiner does not make the modification obvious unless the prior art suggested the  
desirability of the modification.

8 Here, the Examiner relied upon hindsight to arrive at the determination of obviousness. It is  
9 impermissible to use the claimed invention as an instruction manual or "template" to piece  
together the teachings of the prior art so that the claimed invention is rendered obvious. This  
10 court has previously stated that one cannot use hindsight reconstruction to pick and choose  
among isolated disclosures in the prior art to deprecate the claimed invention. ( In re Fritch,  
11 23 USPQ2d at 1783-84 (internal quotes and citations removed).)

12 Respectfully, nothing in the Triplett, Post or Hagiwara references or any knowledge  
13 generally available to one of ordinary skill in the art compels, teaches, suggests or even offers any  
14 incentive such that an individual wanting to invent an electro-mechanical battery such as Applicant's  
15 would utilize a teardrop cross-section for the rotor, as suggested by the Examiner. (See In re Fritch,  
16 23 USPQ2d at 1783; In re Geiger, 2 USPQ2d at 1278; (Jennings Decl. ¶ 9.) Viewing the Triplett,  
17 Post and Hagiwara references and determining that it would have been obvious to combine them to  
18 achieve Applicants' teardrop-shaped cross-section for the composite rotor may be an application of  
19 impermissible hindsight to arrive at the determination of obviousness. (See In re Fritch, 23 USPQ2d  
20 at 1784.)

21 In light of the above arguments, Applicant respectfully requests the Examiner to  
22 withdraw the rejection of claim 12 set forth in the subject patent application (also combined with  
23 claim 1 in new claim 57).

24 The original application included four independent claims and forty-seven total claims.  
25 A total of twenty-six claims, including two independent claims, were cancelled (claims 2, 3, 18, 19  
26 and 28-47) and a total of twenty-two claims (claims 48-69), including two independent claims, were

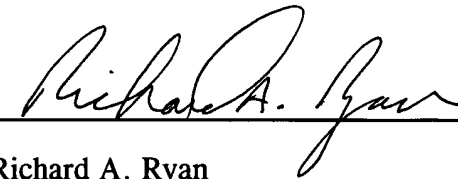
1 added. Therefore, after this amendment, there will be four independent claims and a total of forty-  
2 three claims. As a result, no additional fees for claims are believed due.

3 In view of the foregoing, it is submitted that this application is in condition for  
4 allowance. Reconsideration of the rejections and objections in light of this Amendment is requested.  
5 Allowance of Claims 1, 4-17 and 20-47 are solicited.

6 Dated: April 12, 2004.

7 Respectfully Submitted,

8  
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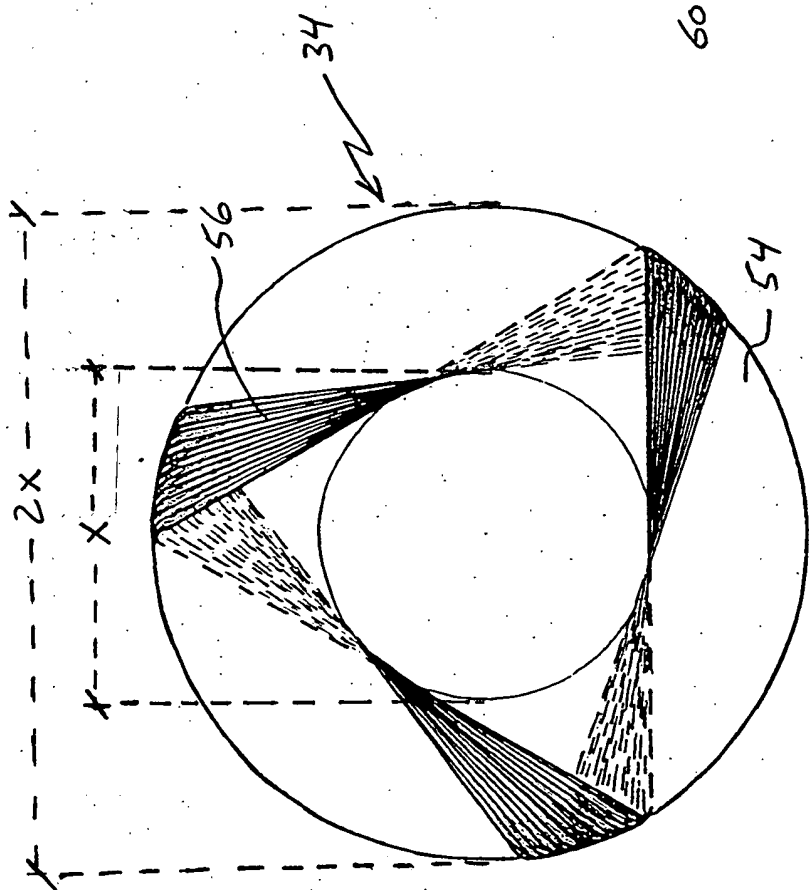


FIG. 4a

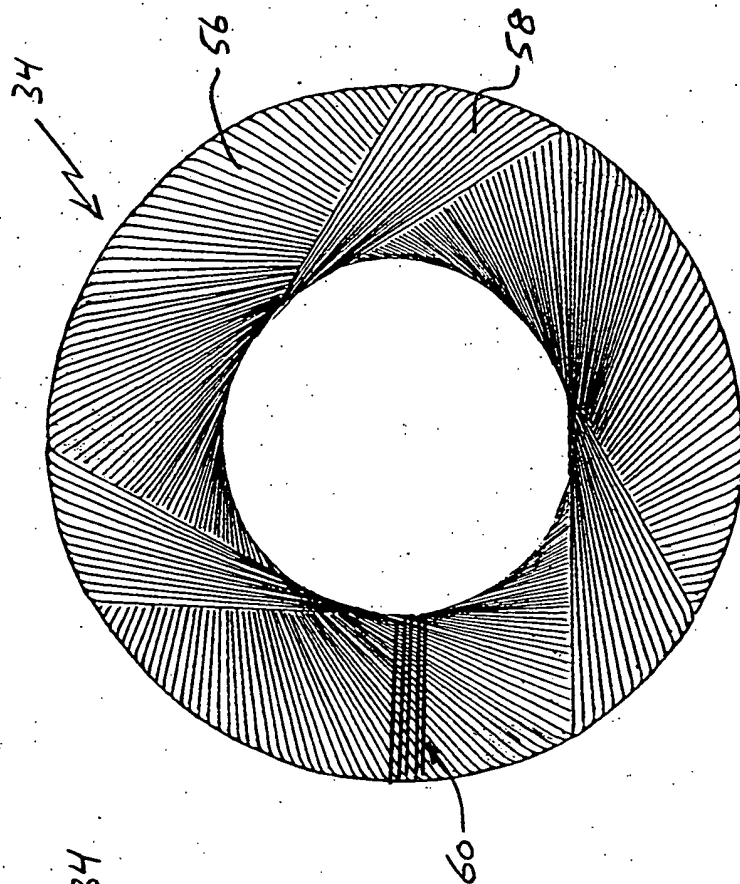


FIG. 4c



FIG. 4b